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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,577	10/31/2003	Tapesh Yadav	037768-0159	1118
24959 7590 10/21/2008 PPG INDUSTRIES INC INTELLECTUAL PROPERTY DEPT ONE PPG PLACE PITTSBURGH, PA 15272				
EXAMINER				
LE, HOA T				
ART UNIT		PAPER NUMBER		
1794				
MAIL DATE		DELIVERY MODE		
10/21/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/698,577

Applicant(s)

YADAV ET AL.

Examiner

H. T. Le

Art Unit

1794

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-53 is/are pending in the application.
- 4a) Of the above claim(s) 36, 37 and 41-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-35, 38-40 and 53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments to 35 USC § 112 Rejections

2. **Claims 16-35, 38-40 and 53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement as set forth in the last office action and further discussed below.**

2.1. As stated in the last office action, the specification describes a secondary element (namely anion X) in the metal compound as "carbon, nitrogen, oxygen, boron, phosphorus, sulfur, chalcogens, and halogens" (instant specification, paragraph [0097]. Chalcogens include O, S, Se, and Te, and halogens include F, Cl, Br and I, which leaves elements H, In, Sb, Al, Ni, Si and Ge unaccounted for.

2.2. Applicant argued that paragraph [0064] lists the elements described in the claims. However, the materials discussed in this paragraph are not the material made by the method described in the instant claims. Rather, the materials discussed in paragraph [0064] are starting stoichiometric materials that are used to convert to non-stoichiometric materials by heating. The process as claimed does not involve a step of converting stoichiometric material to non-stoichiometric material. There are several embodiments described in the instant specification. However, the process as claimed does not rely on the embodiment described in paragraph [0064] of the specification.

3. **Claims 16-35, 38-40 and 53 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for secondary element**

in the metal compound being carbon, nitrogen, oxygen, boron, phosphorus, sulfur, chalcogens, and halogens, does not reasonably provide enablement for elements of H, In, Sb, Al, Ni, Si and Ge, as set forth in the last office action and further discussed below.

3.1. Applicant argued that "Example 1, paragraph 129; Example 10, paragraph 169; and Example 15, paragraph 174 of the present specification, which Examples show ITO, copper doped nickel zinc ferrite, and silicon carbide." Contrary to Applicant's assertion, none of these examples provides an enabling description for the instant claims.

3.2. In Example 1, indium is the dopant, not the metal element in the metal compound. The instant claims, the process as claimed requires that indium ("In") be the second element in the metal compound, not a dopant. Therefore, the process disclosed in Example 1 is not the same process described in the instant claims.

3.3. In Example 10, it is not clear what are the metals in the combined "metal-carboxylate emulsions". The title of the Example 10 states that the formed material is "copper doped nickel zinc ferrite". However, the Example fails to describe when the copper is added to the nickel zinc ferrite and/or how the nickel zinc ferrite is formed from the "commercially purchased metal-carboxylate emulsions". The whole example is confusing because it appears to be incomplete. Therefore, Example 10 fails provide an adequate or enabling description for the instant claims.

3.4. In Example 15, silicon carbide is not the material intended to be produced by the claimed process because the process of the instant claims requires (1) a metal element

and (2) a dopant. Neither metal nor dopant is present in silicon carbide. Therefore, example 15 does not describe the process of the instant claims and thus does not enable "Si" as the second element for the metal compound as recited in the instant claims.

4. Claims 16-30, 32-35 and 38-40 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a combustion process of an emulsion to obtain nanoscale particles, does not reasonably provide enablement for any method other than combusting an emulsion comprising a dopant and a metal compound.

4.1. Applicant argued that such "sufficiently fast method" is described in the US patent 5,851,507 ("507 patent") as Applicant had informed the Examiner about the '507 patent in the response filed Dec. 20, 2007. The '507 '507 does not mention any "sufficiently fast" method. In fact, the method in Patent '507 involves heating to evaporate a precursor material into gaseous state which is not the same purpose for applying "high temperature processing" of the instant claims. '507 patent applies to decompose a material while the "high temperature processing" step of the instant claims appears to form a nanopowder. It cannot be seen how the heating mechanism disclosed in '507 patent would even be relevant to the "high temperature processing" of the claimed invention. There is none of "high temperature processes" that produce doped multi-element nanomaterials disclosed in the '507 patent. Thus, the argument relied on '507' patent is irrelevant.

4.2. Example 11 is not a process of making a doped material. It is a method of making a metal element while the method of the instant claims is a method of making doped multi-element composition. The method in Example 11 involves decomposing a binary precursor material to form a material by subsequent quenching. The claimed method on the other hand requires a dopant to occupy in the lattice of a metal compound upon "high temperature processing". In other words, the embodiment exemplified by Example 11 and the embodiment presented in the instant claims are two distinct embodiments. Thus, Applicant's argument relied on Example 11 is irrelevant to the issue of enablement raised by the Examiner.

5. Claims 16-35, 38-40 and 53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, as set forth in the last office action and further discussed below.

5.1. Applicant argued that the formation of the nanopowder is disclosed at page 36 of the instant specification. However, all the methods listed at page 36 involve a starting material that is already in a submicron powder or nanopowder form. The instant claims however permit the possibility of non-particulate starting material; therefore, the process step where the non-particulate material becomes a particulate material (i.e. nanopowder) is absent. And the absent step renders the claims incomplete and thus indefinite.

5.2. Applicant argued that "...Even if it were possible to heat without producing ... a nanoscale powder form, one of ordinary skill in the art would still be reasonably apprised of when high temperature processing would produce a nanoscale powder".

The Examiner's position is that the "high temperature processing" step is not adequately described in the specification, besides combusting process, and without the teaching of how a non-particulate material transformed itself into a particulate material under "high temperature", one skilled in the art would not be able to envision how particulate material can be formed by following the steps as described in the instant claims.

5.3. Applicant further argued that "relative terms do not automatically render the claim indefinite under 35 U.S.C. § 112, second paragraph. M.P.E.P. § 2173.05(b)." This is true. The Examiner did not hold the relative term "high" automatically indefinite. However, here the term "high" is not defined by the claim and the specification does not provide a standard for ascertaining the requisite degree that constitutes "high temperature". Therefore, the phrase "high temperature processing" renders the claim indefinite.

5.4. *Heating step:* Applicant argued that claim 20 provides antecedent basis for such step by the phrase "wherein creating a composition of matter". The phrase "creating a composition of matter" is the preamble of the process, not a process step. If Applicant's argument is to be accepted, it would be equivalent to claim that "a process of creating a composition comprises heating the composition." Well, how can one heat a composition when it has not even been created yet?

5.5. *Quenching step*: The same query as in paragraph 5.4 above goes to the quenching step.

5.6. *Remaining claims*: The same question is applied to all claims that contain the phrase "wherein creating a composition of matter comprises"...

Response to Arguments to 35 USC 102 rejections

6. Claims 16-35, 38-40 and 53 are rejected under 35 U.S.C. 102(e) as being anticipated by Bickmore et al (US 5,984,997) as set forth in the last office action and further discussed below.

6.1. Applicant argued that the two passages cited by the Examiner are "generic description" and identify "neither explicitly nor inherently a step as recited in the present claims." Applicant appears to overlook the other passages cited by the Examiner. Contrary to Applicant's assertions, there are more than two passages cited by the examiner in the rejection, and they are not generic descriptions.

6.2. In paragraph 10 of the last office action, it is stated:

"Bickmore teaches a method of making doped nanoparticles by combusting a solution or suspension containing a dopant and a metal compound wherein the metal compound containing a metal element and an anion X selected from C, N, O, B, P, S, chalcogens (Se, Te) and halogens (F, Br, Cl, I). The resulting nanopowder is compositionally uniform. See col. 3, lines 50-67 and col. 5, lines 27-50. See col. 2, lines 42-65 and examples 3, 5 and 6 for particular metal elements."

Column 2, lines 42-65 describes doped multi-element nanopowders containing all elements recited in instant claims; therefore, it teaches the same composition as those claimed to be made by the claimed process. At col. 5, lines 27-50, Bickmore describes the specific method of combusting emulsions to obtain "compositionally uniform powder"

as described in the instant claims. In this particular passage, Bickmore gives details as to what process is being applied, i.e. combustion of emulsion, and at what combustion temperature when a compositionally uniform powder will be formed (over 600°C). This passage it is more descriptive than the process described in the instant claims. If this is dismissed as "generic description", then how should one of ordinary skill in the art view the instant claims? Moreover, Applicant appears to have ignored the Examples 3, 5 and 6 in Bickmore cited by the Examiner. Examples 3, 5, and 6 give specific descriptions as how to make the nanopowders of doped multi-elements containing elements cited in the instant claims.

Therefore, contrary to Applicant's argument, Bickmore teaches each and every element of the claimed process.

Conclusion

7. Applicant's arguments filed July 17, 2008 have been fully considered but they are not persuasive for the reasons set forth in sections 2-6 above.
8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. T. Le whose telephone number is 571-272-1511.

The examiner can normally be reached on 9:30 a.m. to 6:00 p.m., Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. (Holly) T. Le/
Primary Examiner, Art Unit 1794

October 16, 2008